Public-Private Partnerships Offer Digital Divide Solution

Communities seek to overcome the challenges of providing broadband to residents and businesses by leveraging federal funding and private capital, enabling risk sharing in the creation of networks powered by open-access infrastructure.

By David Gilford / *Broadband Equity Partnership*

Access to affordable, high-performance broadband remains a challenge for millions of Americans. Whether caused by infrastructure gaps, limited competition, or other policy and market failures, this digital divide has persisted across administrations and decades. Today federal action is making significant new resources available to states and localities for broadband programs, most recently the potential $65 billion in funding under the bipartisan framework for an infrastructure bill reached in late June 2021. The magnitude of this funding enables cities of all sizes to consider bold investments in broadband infrastructure.

Where private internet service providers (ISPs) failed to provide adequate service, cities often turn to municipal fiber to the premises (FTTP) models. With the government becoming both infrastructure owner and service provider, these approaches enable municipalities to design networks that serve their residents and achieve policy objectives. However, analysis by University of Pennsylvania researchers of the financial performance of such networks illustrates the barriers to sustainable operation. Analyzing 20 municipal fiber networks, the study found the majority were cash-flow negative over four years, with only two networks on a path to pay off the debt

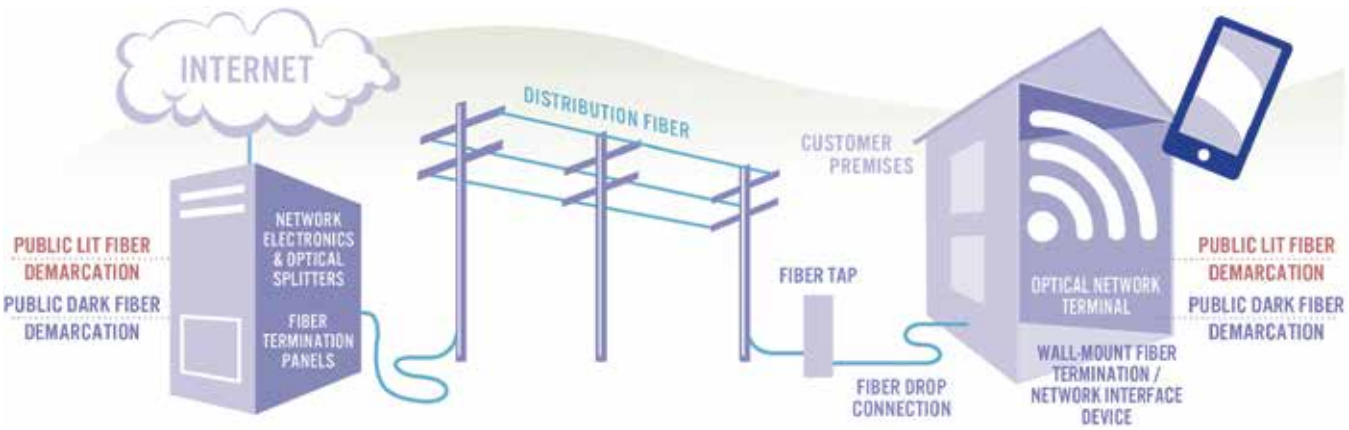

Figure 1. In the dark fiber model, the public entity typically owns the fiber-to-the-premises infrastructure from a fiber termination panel in a network operations center to a network interface device at each residence and business. In the lit fiber model, the public entity also is responsible for network electronics inside the network operations center and the optical networking terminal at the customer premises and may also be responsible for the customer-premises equipment. This figure shows the different elements of the network, with the additional components the public entity owns and operates under the lit fiber approach. Source: The Benton Institute for Broadband & Society

RISK ALLOCATION in THE MODEL

	MARKET RISK	PERFORMANCE RISK	CONSTRUCTION RISK
ALLOCATION	Private	Private	Public
FUNCTIONS	Sales Marketing Service Delivery Customer Service	Network Operations	Engineering Constructions Maintenance
KEY FACTORS	Competition Demographics Consumer Preference	Access to Skilled Labor Technical Expertise	Utility Pole Access Make-ready Cost Right-of-way Congestion

Figure 2. A successful partnership aligns each side's needs and capabilities to allocate risk and responsibility efficiently. Source: The Benton Institute for Broadband & Society

incurred within a network's 30–40-year typical useful life.

NEW P3 APPROACHES

Recognizing these challenges, new public-private partnership (P3) approaches that combine elements of both public and private models are emerging. A proposal from the Coalition for Local Internet Choice (CLIC), "Public Infrastructure / Private Service," outlines what the authors call "a pragmatic, community-driven, pro-market, pro-business approach to advancing broadband in communities where solutions have not already emerged." In such a model, the public sector constructs and owns an open-access fiber network, and private ISPs operate and offer service on this public infrastructure. The public sector thus has control over where the fiber network is built and how it is managed, providing the foundation over which one or more private partners offer internet services. The private sector in turn assumes performance and market risks, competing for customers on service quality and pricing.

For such an approach to succeed, there must be clear delineation between the assets owned and managed by the city (e.g., rights of way, conduit and middle-mile dark fiber) and those owned by the private partner (e.g., last-mile fiber laterals). An early example of this model was Westminster, Maryland, which in 2010 decided to build, own and maintain dark fiber, selecting Ting Internet via an RFP to provide service over this public infrastructure, while striking a risk-sharing agreement that limited each party's downside risk in relation to debt service and performance.

In some cases, cities may choose to provide open-access lit fiber service, as did UTOPIA (Utah Telecommunication Open Infrastructure Agency) Fiber, a group of 11 Utah cities operating at the wholesale level using an active Ethernet infrastructure. The 11 residential and roughly 30 business ISPs offer end users far more options than is typical. Though take rates are lower, UTOPIA says that subscriber revenues have covered debt service on all projects begun since 2009.

	ASSET LEASED	CITY/COUNTY ROLE	CASE STUDIES
LAYER 0	Conduit	Conduit Maintenance	West Des Moines Lincoln
LAYER 1	Dark Fiber	Fiber Maintenance	Westminster Springfield Huntsville Holly Springs Urbana-Champaign
LAYER 2	Lit circuits over fiber	Fiber Maintenance & Optical Network Operations	Utopia Ammon

Figure 3. Across the country, early actors are developing new partnerships to bring next-generation broadband to their communities. Each version includes a creative way for each partner to share the capital, operating, and maintenance costs of a broadband network. Source: The Benton Institute for Broadband & Society

THE COVID-19 EFFECT

In 2020, the onset of the COVID-19 pandemic further accelerated interest in new business models for the construction and operation of networks. Facing a December 15, 2020, deadline, the town of Bristol, New Hampshire, was able to use a $15.4 million allocation from the Coronavirus Aid, Relief and Economic Security (CARES) Act to build the first phase of a fiber network connecting the town to the existing Plymouth State University, selecting eX² Technology to deliver a hybrid network architecture solution using active Ethernet and gigabit passive optical network (GPON) technology.

In some cases, public money may not even be required. In May 2021, Salem, Massachusetts, announced a partnership with SiFi Networks for $35 million in private investment to build a citywide, open-access fiber network. Funded by private investors, such an approach limits the financial risk to a city while creating infrastructure that can be used by multiple ISPs, mobile network operators, and municipal users. By selecting a partner that has the capacity and incentives to engage with the market, cities also have a potential to share in the financial upside of successful projects.

In addition to FTTP, wireless is likely to play a greater role in municipal broadband infrastructure over the coming years. An open-access fiber model enables traditional ISPs and the use of fixed wireless to reach hard-to-serve areas. Similarly, as the 5G deployment accelerates nationally, the rollout of small cells is of increasing importance to municipal leaders. Cities that have open-access fiber infrastructure in place will be best able to adopt multitenant, neutral host networks that provide equitable coverage while supporting municipal use cases such as educational, "borderless classroom" networks.

The variety of approaches cities have adopted recently gives a sense of the catalytic potential of the federal funding being considered this year. An allocation of $65 billion toward universal broadband will have a major impact, yet the full scale of the national need is likely substantially higher. Similarly, once federal funding tapers off, cities will need to position themselves for sustainable operations. Rather than taking the entire task on themselves, municipalities can seek to combine the best of the public and private sectors. For many cities, this may mean leveraging both federal funding and private capital, enabling risk sharing in the creation of networks powered by open-access infrastructure. ❖

David Gilford is a co-founder of the Broadband Equity Partnership, which helps government, nonprofit organizations and innovative businesses close the digital divide.